	Application No.	Applicant(s)
Notice of Allowability	09/890,797	NISHIHASHI ET AL.
	Examiner	Art Unit
	Paulos M. Natnael	2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment received 3/31/05*.

2. ☒ The allowed claim(s) is/are *4,5,9-28,38,39, renumbered as 1,2,3-22,23,24*.

3. ☒ The drawings filed on *06 August 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
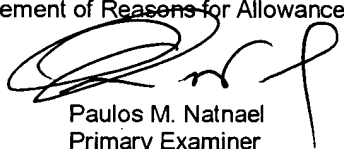
    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

Paulos M. Natnael
Primary Examiner
Art Unit: 2614

DETAILED ACTION

Allowable Subject Matter

1.   Claims **4,5,9-28,38,39** are allowed.

2.   The following is an examiner's statement of reasons for allowance: the prior art (Fujino 6,215,525 and Chui 6,496,608 being the closest) fail to disclose the following combination of steps and apparatus, comprising: an image interpolation system wherein the interpolation segment determining means comprises: a search condition setup means for setting up a pattern search range; a matching pattern condition setup means for setting up matching pattern conditions; and a first matching pattern searching means for searching for matching patterns based on the conditions designated by the search condition setup means and by the matching pattern condition setup means, as in claim **4**;

Wherein the interpolation segment determining means comprises: a search condition setup means for setting up a pattern search range; a matching pattern condition setup means for setting up matching pattern conditions; a first matching pattern searching means for searching matching patterns based on the conditions designated by the search condition setup means and by the matching pattern condition setup means; a directional vector extracting means for extracting the direction of the vector of the detected matching patterns; and a second matching pattern searching means for searching for matching patterns existing in the extracted direction of the vector, based on the conditions designated by the search condition setup means and by the matching pattern condition setup means, as in claim **5**;

Wherein the virtual interpolation data generating means comprises: an inter-pixel

operating means for calculating the difference in pixel data between the pixels on the

neighboring input image lines; and a normalizing means for classifying the pixels into

multiple classes according to the calculated value of the difference in pixel data; and

a pattern extracting means for extracting rows of pixels normalized and classified in an

identical class as patterns, as in claims **11-13**; wherein the virtual interpolation data

generating means comprises: an inter-pixel operating means for calculating the

difference in pixel data between the pixels on the neighboring input image lines; a

normalizing means for classifying the pixels into multiple classes according to the

calculated value of the difference in pixel data; a pattern extracting means for extracting

rows of pixels normalized and classified in an identical class as patterns; and a coring

means for judging the patterns extracted on the same line to be interpolated based on

the predetermined threshold and editing them, as in claims **17-19**;

An image interpolation system interpolating an image on inter-lines between

lines input image, wherein a virtual interpolation data including starting position, length

and sign for a virtual interpolation line pattern with a pixel row as a unit generated based

sign of difference between the pixel and stored in a on neighboring image input

database, data is generated a matching judgment is performed on the virtual

interpolation data on continuous line stored said database an interpolating segment said

interpolating line determined based on said judgment result, pixel row data matching on

the input image line is calculated based on interpolating segment determining data and

the starting position and the length of the virtual interpolation data used for determining

the interpolating segment and a pre-interpolating pixel row is setup on said input image

line based on data said matching pixel row, and images are interpolated in said

interpolating segment on said interpolating line based on said pre-interpolating pixel

row, as in claim **38**; and, a step of generating and storing in a database a virtual

interpolation data including starting position, length and sign for a virtual interpolation

line pattern with pixel row as unit generated based on sign of difference between the

pixel neighboring image input line data, a step of performing a matching judgment on

the virtual interpolation data on a continuous line stored in said database and

determining the interpolating segment on said interpolating line based on said judgment

result, and interpolating matching judgment continuous line stored in said database and

determining the interpolating segment on said interpolating line and based on said

judgment result, and, a step of calculating pixel row data matching on input image

line based interpolating segment determination data and the starting position and length

of the virtual interpolation data used for determining the interpolation segment and

setting up pre- interpolating pixel row on said input image line based on data of

said matching pixel row, as in claim 39.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paulos M. Natnael whose telephone number is (571) 272-7354. The examiner can normally be reached on 10:00am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (571)272-7353. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paulos M. Natnael
Primary Examiner
Art Unit 2614

June 29, 2005